

## Assignment Class X

### Linear Equation in two variables (WORD PROBLEMS)

#### Problems based on Articles and their costs

Q1. 4 tables and 3 chairs together cost Rs. 2,250 and 3 tables and 4 chairs cost Rs. 1,950. Find the cost of 2 chairs and 1 table.

Q2. 3 bags and 4 pens together cost Rs. 257 and 4 bags and 3 pens cost Rs. 324. Find the cost of 1 bag and 10 pens.

#### Problems based on Age

Q3. A father is three times as old as his son. After twelve years, his age will be twice as that of his son then. Find their present ages.

Q4. Ten years ago, a father was twelve times as old as his son, and ten years hence, he will be twice as old as his son will be then. Find their present ages.

Q5. The age of the father is 3 years more than 3 times the son's age. 3 year's hence, the age of the father will be 10 years more than twice the age of the son. Find their present ages.

Q6 A father says to his son, "7 years ago my age was seven times your age, while 3 years hence my age will be three times your age." Find their present ages.

Q7. A and B are friends and their ages differ by 4years, A being elder.. A's father D is twice as old as A and B is twice as old as his sister C. The age of D and C differ by 38 years. Find the ages of A and B.

#### Problems based on Fractions

Q8. The numerator of a fraction is 4 less than the denominator. If the numerator is decreased by 2 and the denominator is increased by 1, then the denominator is eight times the numerator. Find the fraction.

Q9. If the numerator of a fraction is multiplied by 2 and the denominator is reduced by 5, the fraction becomes  $\frac{6}{5}$ . And, if the denominator is doubled and the numerator is increased by 8, the fraction becomes  $\frac{2}{5}$ . Find the fraction.

Q10. The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator. Find the fraction.

#### Problems based on numbers and digits

Q11. The sum of digits of a two-digit number is 9. The number obtained by reversing the order of digits of the given number exceeds the given number by 27. Find the number.

Q12. The sum of two-digit number and the number formed by reversing the order of digits is 154. If the two digits differ by 4, find the number.

Q13. A number consists of two digits. When it is divided by the sum of the digits, the quotient is 7. The sum of reciprocals of the digits is 9 times the reciprocal of the product of the digits. Find the number.

Q14 On interchanging the digits of a number, it becomes  $\frac{5}{6}$  of what it was before. If the difference between the two digits is one, find the number.

#### Problems based on Mensuration and geometry

Q15. If in a rectangle, length is increased by 2 units and breadth reduced by 2 units, the area gets reduced by 12sq. units. If, however the length is reduced by 1 unit and breadth is increased by 3 units, the area increases by 21 square units. Find dimensions of the rectangle.

Q16. In a cyclic quadrilateral ABCD,  $\angle A = (3x + 4)^\circ$ ,  $\angle B = (y - 3)^\circ$ ,  $\angle C = (2y + 10)^\circ$  and  $\angle D = 4x^\circ$ . Find all the angles.

**Problems based on Speed and distance**

Q17. Points A and B are 70 km apart. A car starts from A and another car starts from B simultaneously. If they travel in same direction, they meet in 7 hours; but if the travels toward each other, they meet in one hour. Find the speed of the two cars.

Q18. The boat can go 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. Find speed of stream and boat in still water.

Q19 Manish travels 760 km to his home, partly by train and partly by car. He takes 8 hours if he travels 160 km by train and the rest by car. He takes 12 minutes more if he travels 240 km by train and rest by car. Find the speed of the train and car.

**Problems based on investment**

Q20 Mr. Amit invested Rs. 60,000 partly at 3% per annum and the remaining at 4% per annum. The total interest received after one year is Rs. 2,200. Find how much was invested at each rate?

Q21 A person invested Rs 20,000 and Rs 30,000 at two different rates of interest, earning Rs 1,400 at the end of the year. Later, he found that by interchanging the two amounts invested, he would have received Rs 200 more. Find the two rates at which he invested his money.

**Problems based on fixed and variable expenses**

Q22. The car hires charges in a city comprise of a fixed charges together with the charge for the distance covered. For a journey of 20 km, the charge paid is Rs 75 and for a journey of 12 km, the charge paid is Rs 47. What will a person have to pay for traveling 30 km?

Q23. A part of monthly expenses of a family is constant and remaining varies with the price of wheat. When the wheat is Rs 250 a quintal, the total monthly expense of a family is Rs 1,000 and when the wheat is Rs 240 a quintal, the total monthly expense of a family is Rs 980. Find the total monthly expense of the family when cost of wheat is Rs 350 a Quintal.

**Miscellaneous problems**

Q24. The incomes of X and Y are in the ratio 8:7 and their expenditures are in the ratio 19:16. If each saves Rs 1250, find their incomes.

Q25. Students of a class are made to stand in rows. If 4 students were extra in a row, there would be 2 rows less. If 4 students were less in a row, there would be 4 more rows. Find the number of students in the class.

Q26. A man sold a chair and a table together for Rs 1,520. thereby making a profit of 25% on the chair and 10% on the table. By selling them together for Rs 1,535 he would have made a profit of 10% on the chair and 25% on the table. Find cost price of each.

Q27. 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by 1 man alone and that by 1 man alone to finish the work.

Q28. A lady has only 50 p and 25 p coins in her purse. If in all she has 210 coins of the total value of Rs 82.50, find the number of coins of each type.

Q29. A person invested some amount at the rate of 12% simple interest and some other amount at the rate of 10% simple interest. He received yearly interest of Rs 130. But if he had interchanged the amounts invested, he would have received Rs 4 more as interest. How much amount did he invest at the different rates?

Q30. In a  $\triangle ABC$ ,  $\angle A = x^\circ$ ,  $\angle B = (3x - 2)^\circ$ ,  $\angle C = y^\circ$ . Also,  $\angle C - \angle B = 9^\circ$ . Find all the three angles.

**ANSWERS**

(1) Rs 750 (2) Rs 155 (3) Father's age 36 years and Son's age 12 years (4) Father's age 34 years and Son's age 12 years (5) Father's age 33 years, son's age 10 years (6) Father's age 42 years and Son's age 12 years (7) A's age 24 years and B's age 20 years (8)  $\frac{3}{7}$  (9)  $\frac{12}{25}$  (10)  $\frac{7}{18}$  (11) 36 (12) 59 or 95 (13) 63 (14) 54 (15) 10 units, 6 units (16)  $124^0$ ,  $20^0$ ,  $56^0$ ,  $160^0$  (17) 40 km/h and 30 km/h (18) Speed of stream 3 km/h, Speed of boat 8 km/h (19) train 80 km/h, car 100 km/h (20) Rs 20,000 and Rs 40,000 (21) 4% and 2% (22) Rs 110 (23) Rs 1,200 (24) X's income Rs 6,000, Y's income Rs 5,250 (25) 96 (26) Chair 600 Rs, table Rs 700 (27) Man 140 days and Boy 280 days (28) 25 p coins 90 and 50 p coins 120 (29) Rs 500 at 12% p.a. and Rs 700 at 10% p.a. (30)  $\angle A = 25^0$ ,  $\angle B = 73^0$ ,  $\angle C = 82^0$

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